Nurses’ Perceptions of the Impact of Electronic Health Records on Work and Patient Outcomes

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BACKGROUND AND SIGNIFICANCE

Use of electronic health records (EHRs) in the United States has become more widespread during the last decade, spreading from large academic medical centers to community-based acute care and outpatient facilities. These systems represent a major investment of capital and human resources and affect multiple service providers. They have the potential to improve—or create obstacles to—work performance, communication, and documentation. Because nurses play a key, central role in providing and coordinating inpatient care, the extent to which EHRs enhance or detract from nurses’ role performance can be expected to affect patient outcomes. There is insufficient knowledge about how nurses’ use of EHRs affects their role performance and patient outcomes in community-based acute care settings. The purpose of this descriptive, qualitative study was to describe how community hospital nurses use EHRs as they provide patient care and their views of the impact of EHR use on their work and patient outcomes.

Improving patient safety outcomes is an international priority. The Institute of Medicine (IOM)\(^2\) has identified problems with the United States’ healthcare delivery system, which the IOM describes as poorly organized, complex, and uncoordinated. The IOM also describes concerns with nurses’ work environment, including problems with staffing, unsafe work processes,

This study addresses community hospital nurses’ use of electronic health records and views of the impact of such records on job performance and patient outcomes. Questionnaire, interview, and observation data from 46 nurses in medical-surgical and intensive care units at two community hospitals were analyzed. Nurses preferred electronic health records to paper charts and were comfortable with technology. They reported use of electronic health records enhanced nursing work through increased information access, improved organization and efficiency, and helpful alert screens. They thought use of the records hindered nursing work through impaired critical thinking, decreased interdisciplinary communication, and a high demand on work time (73% reported spending at least half their shift using the records). They thought use of electronic health records enabled them to provide safer care but decreased the quality of care. Administrative implications include involving bedside nurses in system choice, streamlining processes, developing guidelines for consistent documentation quality and location, increasing system speed, choosing hardware that encourages bedside use, and improving system information technology support.

KEY WORDS

Electronic health records • Hospital nursing staff • Nursing care • Nursing informatics • Work

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These studies highlight time burdens with EHR use compared with paper charting. Numerous researchers have looked at the impact of EHR use on nurses’ time, using a variety of methodologies, including time-motion studies, work sampling, and self-report. Results vary, with findings of no change and increased and decreased time burdens with EHR use compared with paper charting.

Kaplan argues that a clinical information system’s success or failure in practice is related to its “fit” with workplace culture, work practices, and users’ information needs, among other factors. Systems that do not provide important benefits to users or conform to their professional values and work patterns may lead to resistance, which can manifest as refusing to use a system, criticizing it, or minimizing its use. Patient care information systems with a poor “fit” to workplace needs can lead to increased errors related to entering or retrieving information or to hampered communication and coordination among team members. Systems that do not support nurses’ work practices, through disconnects in location or documentation design, lead to lower acceptance. These studies highlight the need to understand the work context in which the EHR system resides and the meaning that EHR use has to nurses, questions that can be addressed through a phenomenological qualitative approach. Additionally, these studies investigated EHR use mainly in large medical center settings. Not enough is known about the effect of EHR use in community hospital settings or its impact on nurses’ job performance.

The nursing role effectiveness model provides a theoretical framework for assessing the effect of EHRs on nurses’ role performance and patient outcomes. This structure-process-outcomes model for assessing nurses’ contribution to healthcare operationalizes nurses’ roles and ties them to selected patient and cost outcomes. The structure component addresses nurse (experience, knowledge, skills), organization (staff mix, workload, assignment pattern) and patient (health status, severity, morbidity) variables that affect nurses’ ability to effectively perform their roles. The process component addresses nurses’ independent, dependent, and interdependent roles. Nurses’ independent role includes activities for which nurses alone are responsible, such as nurse-initiated actions and the nursing process. Nurses’ dependent role includes activities related to implementing medical orders and treatments. The interdependent role concerns activities that require collaboration between nurses and other healthcare providers. The model identifies nurse-sensitive patient outcomes related to the three nursing roles. Examples of outcomes linked to nurses’ independent role include symptom control, functional health status, knowledge of self-care strategies, satisfaction, and costs. Outcomes linked to the dependent role include adverse events such as medication errors. Outcomes linked to nurses’ interdependent role include team functioning and collaboration. The model suggests that the effect of EHRs (a structural variable) on patient outcomes is mediated through the process of nursing role performance. The model proposes that the impact of unit and nurses’ structural variables on patient outcomes is mediated through the process of nursing role performance. The model suggests that the effect of EHRs (a structural variable) on patient outcomes is mediated through how nurses use EHRs and how this use affects nurses’ role performance.

This study sought to answer several research questions related to nurses’ experience with the phenomenon of EHRs. How do community hospital nurses use EHRs? What effect do they think EHR use has on their ability to perform nursing care? What effect does EHR use have on patient outcomes? Findings of this study can shed light on intended and unintended consequences of EHR use and inform evaluation of the impact of EHR use on nursing productivity and care outcomes.

**METHODOLOGY**

This descriptive qualitative study based on phenomenological principles used questionnaire surveys, individual interviews, and observation techniques to describe nurses’ experiences with EHR use in community hospitals and the meaning the nurses derived from this experience. Qualitative methodology was an appropriate choice because the goal was to understand the meaning of a phenomenon—EHR use and its impact on role performance—from the perspective of working nurses. Rich descriptions of participants’ experiences, consideration of the context of these experiences, and inclusion of multiple viewpoints allowed an overall picture of the phenomenon to emerge.

Questionnaire surveys consisting of open-ended questions were collected first to explore the boundaries of the phenomenon of how nurses use EHRs and perceive its impact on work performance and outcomes. Next,
the researcher observed nurses on the study units use EHRs and concurrently interviewed them. These observation/interviews allowed the investigator to identify practice patterns as well as problems encountered with EHR use and “work-around” solutions nurses employed. They broadened understanding of the phenomenon and allowed clarification of issues or conflicts noted in survey data. Trustworthiness was addressed through using multiple methods of data collection (triangulation), and representativeness was increased by using multiple units and nurse participants. Human subjects’ protection was ensured through institutional review board review at the hospitals and the researcher’s university.

Analysis was concurrent with data collection. Interview data were coded for themes representing meaning of the experience and facilitated by a qualitative software program. Emerging codes and themes influenced observations and questions in later interviews, as clarification, validation, or refutation was sought.

Setting

The setting was a medical-surgical floor and intensive care unit (ICU) at two community hospitals within a regional Midwestern healthcare system, both in the second year of implementing the same EHR system. Nurses used laptop computers on carts and desk computers to access the EHR. Hospital 1 has 157 beds and is located in a midsize city (110,000); hospital 2 has 47 beds and is located in a rural community. These two types of units were chosen because they differ in attributes that theoretically may affect nurses’ work: patient acuity, workload, and pace of work.

The EHR system used at these two hospitals was purchased was reached by compromise, and the same system was installed in each of the six hospitals in the system reviewed and rated available systems for desired functionality. No one system was rated highest by all groups. Selection of the EHR system purchased was reached by compromise, and the same system was installed in each of the six hospitals, which ranged from a 700-bed tertiary care facility to 40-bed rural hospitals. In the larger of the two hospitals used in this study, an automated medication dispensing system was also used, and documentation was linked to the EHR. Physicians did not consistently use the EHR system in these two hospitals, either for notes or order entry. Computerized provider order entry was available but not widespread in the study hospitals. Typically, unit secretaries entered written nonpharmacy orders from physicians and pharmacists entered medication orders into the computer system. The multidisciplinary EHR team met quarterly to review EHR use and functionality. Staff were encouraged to forward suggestions for improvement to the committee for review. Changes, when they occurred, were systemwide.

SAMPLE

A convenience sample of nurse participants volunteered after solicitation through direct e-mail, a letter placed in their work mail slot, and flyers posted in the units’ break rooms that described the study. Inclusion criteria were that nurses worked on either the medical-surgical floor or ICU and had used the EHR system for at least 6 months. There were no age, gender, or race exclusions. Participants completed informed consent and demographic data forms (including a self-rating of comfort with technology use, years of experience, and age) in addition to completing a survey or participating in an observation/interview. Data collection continued until saturation (indicated by no newly emerging themes or concepts) occurred.

Forty-six nurses participated, representing a 50% response rate at both sites. At the larger urban hospital, 31 nurses completed 29 surveys and 15 interview/observations. At the smaller rural hospital, 15 nurses completed 13 surveys and 7 interview/observations. Demographic data are presented in Table 1. Six nurses who participated in interview/observations did not complete demographic data forms, so percentages in the table are based on 40 participants. A nurse representing the median values in this sample is female, 35 years old, BSN prepared, has worked for 9 years, is comfortable with technology, and spends 50% of shift time using the EHR. With 62% of participants aged 40 years or younger (mean, 37.7 years), the sample overrepresents younger nurses. However, the mean age of nurses working at these two hospitals is 40 years, suggesting that the sample is reflective of a local nurse workforce that is younger than the national average. Additionally, the sample may overrepresent BSN-prepared nurses; they composed 55% of the sample, compared with 47% of the hospitals’ nurses.

Findings

Community hospital nurses in this study perceived that EHR use affected their work and patient outcomes. Specifically, the nurses perceived EHR use is extensive and time consuming; both helps and hinders nursing work; has positive and negative effects on patient
outcomes; and is preferred over paper charts but should perform better to support nursing work. Concepts and illustrative quotes supporting these findings are presented next.

**EHR USE IS EXTENSIVE AND TIME CONSUMING**

Nurses reported using EHRs for all aspects of patient care documentation, including reviewing and charting assessments, care planning, treatments, medication administration, admissions, and discharges. They accessed pertinent clinical information, including transcribed reports, laboratory and diagnostic test results, interdisciplinary notes, and past history. They organized their shifts through accessing and updating work lists (scheduled treatments) and medication lists. Nurses described using EHRs for multiple reasons, including “For virtually all documentation of care. For worklists, both task and medication. To review orders, labs, radiology.” Nurses also described frequent use of EHRs. One said, “I use them constantly to look up information, record information, and to communicate with all departments.” Another commented, “We use EHRs all the time. The only thing I write on the chart is an order and occasionally I put orders in the computer.”

Nurses’ self-report of time spent using the EHR system supported its extensive and frequent use. Nurses estimated they spent from 25% to 98% of their work shift using the EHR, with a median of 50% and mean of 56.6%. The majority (73%) reported spending at least half their shift using the EHR system, whereas three nurses reported spending more than 90% of shift time, a rather astounding amount. These three were bedside nurses employed in the rural hospital, two in their 30s and one in her 50s, all reporting high levels of comfort with technology. Nurses reported time spent “using EHRs”; it is unclear how much of this time was spent documenting nursing care because nurses also described using EHRs to obtain patient information and communicate with other team members. However, observations of nurses noted they charted on 23 screens per patient during day shift initial assessments. As the number of screens accessed for data entry or information retrieval increase, reading and screen refresh time add to time spent interacting with the EHR.

**EFFECT OF EHR USE ON NURSING WORK**

Nurses described ways EHR use both enhanced their ability to work and also hindered it, for example:

EHRs affect how I do my work by both slowing down and speeding up charting and investigating patients records. Sometimes the computers are down and this slows the charting process down. Otherwise, it speeds up the process to give medications, get reports, and to communicate with other facilities.

Overall the nurses thought the benefits of EHR use outweighed its detractions; only two nurses stated a preference for paper charting. However, problems encountered with EHR use caused frustration and a
sense of decreased effectiveness in job performance and patient care. Two comments illustrate this:

It can be very frustrating and a cause for concern if the computers go down unexpectedly. When this happens, I feel like I don’t know what needs to be done and I usually don’t know if a med is due.

At first I thought it made a big damper on patient cares...all you ever saw was nurses on computers. You never saw nurses with patients. I still feel like there [are] days where you’re trying to balance your patient care and your charting, because it takes a while. And I never really noticed it when we were still doing the paper charting.

Enhances Nursing Work

Nurses identified increased access to patient care information, improved efficiency, and organization as EHR attributes that enhanced their work performance.

Increased Access to Patient Information

Nurses described several ways increased access to patient information enhanced their job performance. First, they spent less time searching for records and finding the patient’s chart. A nurse said “it makes things easier...it’s nice having everything at my fingertips.” Another commented:

I have quicker access to test/lab results. I can chart and review a chart anytime, even if another nurse/doctor/secretary is accessing the chart. I have easy access to much of a patient’s old chart.

Second, nurses could more easily access patient information needed for clinical decision making. One said, “If I wanted to find when the last time a medication was given, just a couple clicks and I have the answer.” Another nurse described using the EHR to find information on a patient who would be admitted for postoperative care later in the shift:

I’m checking on a surgical patient who’s in the OR now. Checking what the preop(ervative) screening put in about diagnosis, discharge...who is the support person in case he gets an ostomy... preop(ervative) checklist, the pain and comfort level, check diagnostics to see if there was a CT of the abdomen. This gives me an idea of what to ask the OR nurses in report...what else I need to know.

Increased Efficiency

Nurses thought EHR use improved their efficiency through quicker documentation and information retrieval processes. Comments included “It speeds up the process to give medications, get reports, and to communicate with other facilities” and “(It is) quicker to type or ‘click’ on information than to hand chart.” Another nurse said, “I think it enhances (documentation)...because it flows better...You can go right from your vital signs to your pain to your physical assessment...It’s more efficient, quicker.” Nurses also felt automatic notifications and alert screens improved efficiency:

If you have new orders and different things like that, when you check your med sheet it pops right away, you’re not having to go straight to the chart. It automatically gives you an alert for that. So that makes it more efficient.

Other aspects of EHR use identified as improving efficiency were having “portable workstations so you’re not confined to being at a desk” and spending less time deciphering written notes and orders.

Improved Organization

Nurses thought EHR use made them more organized through provision of task lists, systematic charting and prompts, and less reliance on their memory or written notes. Work lists were a popular feature: “I have work lists to help me remember what needs to be done” and “the worklist shows what I have to do today by patient and medications listed and treatments. I select meds, hit med history. Find out where are pms needed.” A nurse described charting assessments:

I work down and across that way I don’t forget things, starting with vital signs. Then I go down to Intake/Output and record anything there that needs to be recorded. We’re just going sequentially down and across when things pop-up. And that’s what keeps you organized.

Hinders Nursing Work

However, nurses also identified several ways that EHR use hindered their job performance, including increasing time spent retrieving or documenting information, decreasing time spent with the patient, interfering with written interdisciplinary communication, and hindering critical thinking.

Slows Nurses

Several computer- and EHR-related issues increased the time nurses spent on the computer. System speed, downtime, and lack of available or functional computers...
all interfered with nurses’ ability to efficiently manage time. Slow response was a common complaint: “It’s very slow, the computer is slow. When there is a glitch or a problem with it, it can really upset your whole day. It can stack everything up.” Several nurses expressed frustration with competing for computers, as in “Lack of a computer when you need one. Getting up to answer the call light and you come back to find someone has logged you off your computer and [taken] it over. Aughh!” System downtime created problems with time management. A nurse noted:

Drawbacks include not being able to access the patient’s chart/MAR/orders when the computer system is down. Then when the system comes back up, I have to try and chart all that happened during the downtime. It can be very frustrating and a cause for concern if the computers go down unexpectedly.... Also it is frustrating when computers keep freezing up.

Duplicate charting due to high patient acuity or unavailability of computers also contributed to increased time spent documenting care, as described in this quote:

I find that if I’m busy and I’ve got a patient that has a lot going on and I need to be in the room more, I jot things down on paper and transcribe it into the computer. I’m not sure if that’s adding an extra step from the paper charting, where you could just scribble it down there. It would be hard to take a break in that situation and go input it into the computer. So I don’t find that it interferes with my patient care, patient care comes before my charting ...if I find myself in a bind like that I end up just jotting it down to come back to later. It’s just that sometimes it will take me longer to get my day finished.

**Decreases Time With Patients**

Spending more work time using EHRs left nurses feeling they had less time to spend on patient care. Even though nurses could use portable computers on wheels at the patient’s bedside, many felt it distanced them from patients. One said, “[It] takes time away from patient care, even though I can take [the] computer into [the] room. I want to look at my patient and not at a screen during assessments. At times, patients will ask ‘What are you doing behind the desk on that computer?’” Several nurses commented that “nurses seem to have less time to spend on patient care.” One elaborated on this: “Nurses seem to be more focused on the computer than the patient needs, for example blocking out the call lights ringing while trying to finish charting on the computer.”

**“Have to Think Outside the Box...the Checkbox”**

Nurses thought EHR use could limit their critical thinking and charting accuracy, especially if they relied too heavily on checkboxes, drop-down menu selections, and cut-and-paste features that allowed data charted from a previous nurse to populate their assessment and documentation screens. One nurse described a charting dilemma:

You get very lazy in your charting and documenting properly the way you see it. Take a surgical patient. You’re viewing the incisional area. Here you’ll have a checkbox. Is [the incision] pink all the way down? And the patient may have not just staples, they may have retention sutures. There’s nothing in there for retention sutures. So do you think I’m going to say anything about them? Probably not... it’s not one of the things you can click on.

Another nurse expressed concern about the copy-and-paste feature. “It’s easy to see what other people charted before you, even on the assessments, and it gets hard to not copy and paste... You actually have to stop and think about what I saw.” Client data not included in checkboxes or drop-down menus could be entered as free text in summary notes attached to the appropriate nursing documentation page. However, nurses said they were less likely to chart such data:

You could get a patient on a ventilator and... I’m not charting and getting the things I should be. And that’s because you don’t take the time to type in your summary notes like you should, you’re too busy for one thing, and this is very time consuming.

**Doctors and Nurses not Reading Notes**

Nurses reported that interdisciplinary team members did not read each others’ notes in the EHR and felt this limited communication among nurses and between team members. They identified problems locating the notes, including lack of physician familiarity with the EHR and inconsistency in charting locations. A nurse said:

Nursing progress notes are in the computer, and physician progress notes are in the hard chart.

I think that the nursing notes do not get read, they’re not as easy to access... it just says note... I print it off and put it in the chart so they’ll see it.

Another nurse described problems with inconsistent charting detail and location, which interfered with communication. “There is no place in the EHR to chart things like a nitro drip... you have to add it in and not everybody does that because they don’t know. And not everybody does it consistently or in the same place.” A nurse alluded to the frustration felt with this lack of
communication. “No one has time to read the nursing notes or read the updates. So all that work is not really helping anyone.”

**Effect of EHR Use on Outcomes**

**Patient Safety**

Nurses thought EHR use improved patient safety. Specific features, such as requiring essential patient data entry and allergy alerts, prevented inadvertent errors. A nurse described the process: “You have to complete the admission screening first. Have to enter in the height, weight, allergies. You can’t get any of the ordered meds until they have these in the database first.” Another nurse commented, “I believe patient care is more safe, especially with cross referenced systems such as the Pyxis. I like having information such as allergies prior to treatment available. I like knowing when medications or treatments are given and by whom.”

**Quality of Care**

However, nurses felt that quality of patient care decreased with EHR use due to less time spent at the patient’s bedside and loss of personalization. A nurse said, “If you take the computer in, my only complaint is that patients have told us they feel they are answering questions to a computer because you are looking at the computer and entering everything. You lose that personal one on one, looking in the eye kind of thing with your patient.” Another expressed frustration at spending less time at the bedside. “You’re being strapped to a computer. You think you’re able to give more care and see your patients more... but that’s not true. I see my patients a lot less because of the computer. I’m strapped to this computer. They’re taxing to me.”

**EHR ACCEPTANCE**

Nurses’ acceptance of EHR use was elicited by the question “If you heard the system had to go down tomorrow how would you feel?” Overwhelmingly, nurses in both hospitals and types of care settings preferred EHRs to paper patient records. Nurses commented they would feel: “Frantic! I have not been trained to do paper charting AAHH!”; “Overwhelmed!”; and “Upset that I couldn’t compare results.” This high acceptance was found across age groups. Only two nurses said they preferred paper charts. One thought communication, especially with physicians, was enhanced with paper charts, and the other said poor typing skills negatively affected comfort level using the EHR.

**DISCUSSION**

In this study, community hospital nurses overwhelmingly preferred the EHR to paper records but wanted it to perform better to support their nursing work. Several issues may have affected these nurses’ high acceptance level. First, the EHR system in this study had been used for 18 months at both hospitals and nurse respondents had used it at least 6 months. Thus, the system was mature, the initial training and troubleshooting period was completed, and nurses had time to integrate it into their work routine. Second, study nurses across the age span reported a high level of comfort with technology. Only 5% of nurses rated themselves as uncomfortable with technology, whereas 83% self-rated as very comfortable. Finally, study nurses thought they had at least some voice in system improvements. They identified areas where the EHR system’s “fit” with nursing practice could be improved and most identified the hospitals’ mechanism for system improvement input.

Despite this high acceptance, nurses had many criticisms of the EHR system. In a study of United Kingdom nurses, Timmons16 interpreted similar criticisms (time consuming, not enough terminals, detracts from individualized care) as examples of nurse resistance to a clinical information system. In this study, nurses stated preference for the EHR over paper charts and dismay at the thought of the system going down, which suggests that the criticisms reflect a desire for system improvements that would better support nursing care, rather than resistance to EHR use.

Nurses used EHRs extensively, reporting spending, on average, more than half their shift time using the computer, a much higher percentage than reported in the literature. In a systematic review of the impact of EHRs on time efficiency, EHR use resulted in an overall decrease in percent of shift time nurses spent documenting, with the most time spent documenting reported as 36% of the shift. Other studies using time-motion or work sampling techniques have found either no change in documentation time9 or an increase. Several factors may help explain the high time commitment with EHR use noted in this study. First, nurses self-reported shift time spent using the computer. There was no objective measurement of usage time, and the self-reports could have been overestimated. This seems the most realistic explanation for several bedside nurses reporting spending 90% or more of their shift using the EHR. Second, nurses reported total time spent using the computer; they did not differentiate between using the EHR system for care documentation versus other tasks, such as finding patient data or reading other discipline’s notes. It is reasonable that additional EHR-related usage would result in additional time spent using the computer.
Nurses thought that EHR use affected their work and patient outcomes in both positive and negative ways. Their comments indicate EHR use had a differential effect on performance of the three nursing roles. Dependent role functions (carrying out the medical treatment plan) were well supported by EHR use. Nurses thought their organization and efficiency were improved through EHR-generated work lists, new order and medication alerts, and updated medication administration records, especially when these synchronized with an automated medication dispensing system. In contrast, interdependent role functions (those related to team functioning) were hindered. Nurses perceived that doctors and other nurses did not read nurses’ documentation in the EHR, especially the free text entries, thus limiting team communication. The independent role functions (actions and responsibilities for which the nurse alone is responsible) were helped in some ways by EHR use but hindered in others. Improved access to patient information, more efficient information retrieval, organized documentation systems and portable workstations enhanced nursing assessment, care planning, and care provision functions. However, these enhancements were countered by the time nurses spent using the EHR, which limited time spent interacting with patients. Further, nurses reported concerns that the format of drop-down menus, checkboxes, and copy-and-paste features limited their critical thinking and the accuracy of their documentation.

Findings support Doran’s nursing role effectiveness model. The model suggests that the effect of a structural variable, an EHR system, on patient outcomes is mediated by nurses’ use of the EHR and its impact on nursing role performance. In this study, nurses felt EHR use improved the outcome of patient safety by preventing errors. In the nursing role effectiveness model, the outcome of preventing adverse events such as medication errors is linked to nurses’ dependent role functions, a nursing role enhanced by EHR use in this study. Nurses reported that EHR use decreased the quality of patient care due, in large part, to time spent away from the patient. Nurses’ independent and interdependent roles were hindered, at least in part, by EHR use in the study. In the nursing role effectiveness model, healthcare team functioning is an outcome of the interdependent role and indirectly influences patient outcomes linked directly to the independent role. These direct outcomes of the independent role include symptom control, functional health status, knowledge of self-care strategies, satisfaction, and costs. Although these measures certainly indicate quality of care, it cannot be ascertained that this was the meaning study nurses attributed to the phrase. However, it can be concluded, that these nurses perceive that use of EHRs affects their role performance and this, in turn, affects patient outcomes.

CONCLUSIONS

The majority of healthcare in the United States occurs in community hospitals, which often are slower to adopt innovations and have fewer resources than large academic medical centers and urban hospitals. National efforts to improve healthcare quality include a focus on information technology to support safe and effective practice, and EHR systems use is increasing rapidly. An EHR system represents a significant resource outlay for smaller hospitals with no guarantee of improvements in patient care and outcomes. Findings of this study offer support for EHR use in community hospitals and suggest areas for improvement in EHR products to better support nursing work.

IMPLICATIONS

An EHR system can improve patient outcomes by enhancing healthcare providers’ ability to work efficiently and effectively. The constraints EHR use made on these nurses’ work cause concern and suggest a need for administrative attention to EHR system selection, performance, and support issues. Nurses thought they spent less time with patients and that EHRs “slowed me down.” They identified constraints on communication and critical thinking related to inconsistent charting locations and data entry features (checkboxes, drop-downs, and copy-and-paste function) that affected accuracy of documentation.

Selecting EHR systems that improve time efficiency and better support communication and critical thinking could improve nurses’ role performance. Bedside nurses as well as nurse administrators should be involved in system selection and tailoring to meet local needs. Attention could be placed on streamlining EHR work processes, redesigning interfaces to reduce number of screens, developing guidelines to improve consistency in documentation quality and location, increasing system speed, and choosing hardware that encourages bedside use. Improvements in these areas may be costly but could reap large benefits in increased work performance.

Additional research is needed to more clearly elucidate the effect of EHR use on nursing work and patient outcomes. The applicability of this study’s findings to other settings is limited by the small sample size, self-report methodology, and use of one EHR system in which physicians did not fully participate. More work is needed to investigate more fully the effects of EHR systems on nurses’ critical thinking, communication, and role performance and patient outcomes using more objective measures.
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